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## LISTS OF SPECIES

# Macrocrustaceans of non-consolidated sublittoral of the São Vicente Estuarine Bay Complex, São Paulo state, Brazil

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**Abstract**
Despite the economic importance of the carcinofauna which inhabits the estuarine regions of São Vicente, state of São Paulo, Brazil, there are few studies of the biology, distribution and biodiversity of crustaceans. The aim of this work was to list the species of macrocrustaceans that inhabit the non-consolidated substrates of Estuarine Bay Complex in São Vicente. After two years of monthly collections, we recorded two orders: Stomatopoda and Decapoda, represented by 13 families and 26 species. Only one species of the order Stomatopoda was recorded, all other 25 species belonging to the order Decapoda. Nine species of shrimp, in five families were captured; five of these belong to the family Penaeidae, one to Sergestidae one to Sycioniidae, one to Palaemonidae and one to Hippolytidae Anomuran crabs were composed of five species of hermit crabs. Brachyuran crabs were more prominent, with 11 species, most in the family Portunidae.

## Introduction

Many decapod crustaceans are targets of intense fishing, even those which live in more sheltered areas such as estuaries. Severino-Rodriguez et al. (2001) described the small-scale fishery of Portunidae crabs in the area of Santos and São Vicente, reporting that this resource is intensively exploited as a source of income by the riverine families who fish in about 12 different locations. Several species of decapod crustaceans are exploited commercially in the estuarine region of São Vicente, as the shrimp *Litopenaeus schmitti* (Burkenroad, 1936) and the crabs of the genus *Callinectes* but in spite of their commercial importance there are few published reports on the crustacean fauna of the non-consolidated sublittoral bottoms, and these treat only a part of this group. Pita et al. (1985a) analyzed bioecological aspects of *Callinectes danae* Smith, 1869, and later examined the species of Portunidae of the Estuarine Bay Complex of Santos and São Vicente (Pita et al. 1985b). In a somewhat more inclusive study, Moreira et al. (1988) treated the bioecology of all brachyuran decapods. More recently, Zangrande et al. (2003) characterized the distribution of *Arenaeus cribrarius* (Lamarck, 1818). There are no studies on other groups such as Anomura, Penaeidae and Stomatopoda of the non-consolidated substrates in this area. In view of the sparsity of studies, the purpose of the present work was to list the species of macrocrustaceans that inhabit the non-consolidated substrate of Estuarine Bay Complex in São Vicente, state of São Paulo, Brazil.

## Material and Methods

Crustaceans fauna were collected monthly from September 2000 to August 2002 in the sublittoral soft bottoms of the São Vicente Estuarine Bay Complex (23°58'21'' S, 46°23'35'' W), state of São Paulo, Brazil, along four transects in the bay and estuary of São Vicente: Transect 1 (T1), Praia do Itararé, between Ilha Porchat and Ilha Urubuqueçaba; Transect 2 (T2), in front of Praia de Paranapuã, behind Ilha Porchat; Transect 3 (T3), in Largo de São Vicente, between Ponte Pênsil and Ponte do Mar Pequeno; and Transect 4 (T4), in Largo de São Vicente, between Ponte do Mar Pequeno and Ponte dos Barreiros (Figure 1).

On the four transects, the animals were caught from a shrimp boat fitted with two otter trawls with 10-mm-mesh nets, towed for 20 minutes for each transect. After each drag, the animals were identified according to Melo (1996; 1999) and classified according to Martin and Davis (2001). Some specimens from this study are deposited in the collection of the Teaching Laboratory of the Campus Experimental do Litoral Paulista, Unesp - São Vicente Unit.

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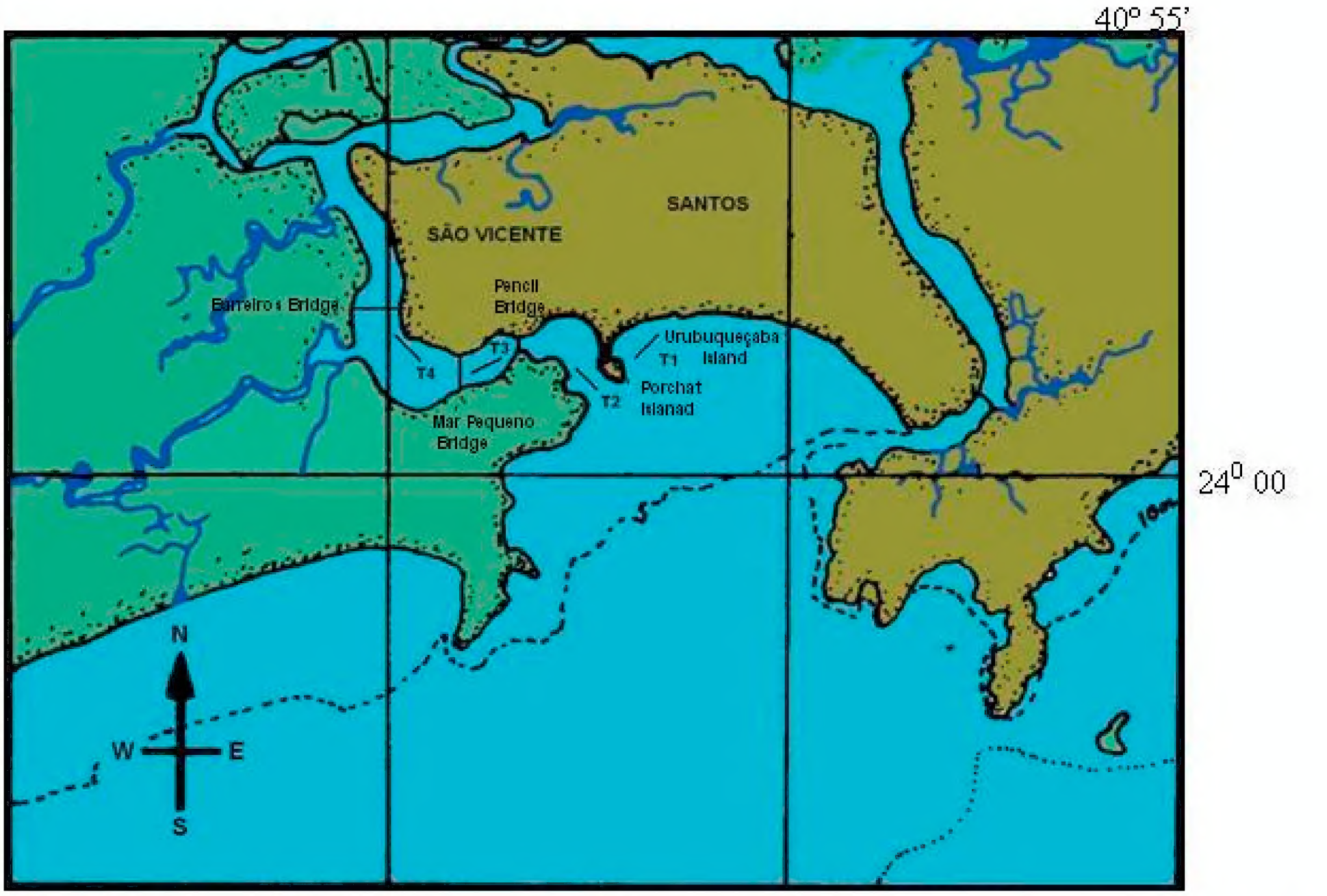


**Figure 1.** São Vicente Estuarine Bay Complex. Collection locations: Transect 1 (T1); Transect 2 (T2); Transect 3 (T3); Transect 4 (T4).

**Results and Discussion**

Two orders of crustaceans, Stomatopoda and Decapoda, were recorded. The Stomatopoda was represented by only one species, *Lysiosquilla scabricauda* (Lamarck, 1818). The order Decapoda was much more prominent, with 12 families and 25 species. Members of five shrimp families were caught (Table 1); five of the nine species belong to the family Penaeidae. The infraorder Anomura was represented by five species of hermit crabs (Table 2), and the infraorder Brachyura had 11 species, more half in the family Portunidae (Table 3).

In this area, Pita et al. (1985b) recorded three species of Portunidae which were not captured in the present study: *Cronius ruber* (Lamarck, 1818), *Portunus spinimanus* Latreille, 1819, and *Callinectes larvatus* Ordway, 1863. Our failure to collect *C. ruber* is explained by the larger study area sampled by Pita et al. (1985b), who made tows in shallow water along the beaches, next to the rocky shore as well as in deeper waters. *Portunus spinimanus* and *Callinectes larvatus* were recorded in low frequencies by Pita et al. (1985b): only 1 specimen of *C. larvatus* and 15 of *Portunus spinimanus*. Similarly, Moreira *et al.* (1988) caught *P. spinimanus* in areas along the beaches and in the bay, always with low occurrence frequencies. For an eight-year period, Severino-Rodriguez et al. (2001) observed the landings of the local crab fishery, and mentioned neither species. Probably the lack of these portunid species in the present study and that of Severino-Rodriguez et al. (2001) can be accounted for by their low abundance in the area.

Three additional species, *Persephona punctata* (Linnaeus, 1758), *P. mediterranea* (Herbst, 1794) and *Menippe nodifrons* Stimpson, 1859 were

found by Moreira et al. (1988). Similarly to Pita et al. (1985b), these investigators used different collection methods which increased the sampling area, and along the rocky shore they caught specimens of the Guaiá crab, *M. nodifrons*, which normally occurs in these habitats (Oshiro 1999).

*Charybdis hellerii* (A. Milne-Edwards, 1867), native to the Indo-Pacific and Red Sea regions, has migrated to the Mediterranean through the Suez Canal (Rodriguez and Suarez 2001), and several localities in the Caribbean. In Brazil, the occurrence of this species was first recorded in 1995 by Carqueija and Gouvêa (1996) in Todos os Santos Bay, state of Bahia; in 1996, it was found in the southeast region by Mantelatto and Dias (1999). In the receiving communities, exotic species can interfere directly by displacing native species or predating on other members of the community. Indirectly, they may harm native species through the introduction of diseases (Carqueija and Gouvêa 1996). Therefore, continuing studies are necessary on the behavior and the impacts caused by introduced species such as *C. hellerii*.

In the present study, we recorded the occurrence of 26 species of crustaceans in the non-consolidated substrates of the Estuarine Bay Complex in São Vicente. To complete this list, we add five species which can also be found in the sublittoral soft bottoms of this estuarine area. These include the crabs of the family Leucosidae: *Persephona punctata* and *P. mediterranea*; the swimming crabs of the family Portunidae: *Callinectes larvatus* and *Cronius ruber*; and the crab of the family Menippidae, *Menippe nodifrons* (Pita et al. 1985b; Moreira et al. 1988).

**Table 1.** Species of shrimps recorded in the São Vicente Estuarine Bay Complex.

| Order | Family | Species |
|---|---|---|
| Decapoda | Sergestidae | *Acetes americanus* Ortmann, 1893 |
| | Sicyoniidae | *Sicyonia dorsalis* Kingsley, 1878 |
| | Penaeidae | *Farfantepenaeus brasiliensis* (Latreille, 1817) |
| | | *Farfantepenaeus paulensis* (Pérez Farfante, 1967) |
| | | *Litopenaeus schmitti* (Burkenroad, 1936) |
| | | *Rimapenaeus constrictus* (Stimpson, 1874) |
| | | *Xiphopenaeus kroyeri* (Heller, 1862) |
| | Palaemonidae | *Palaemon pandaliformis* (Stimpson, 1817) |
| | Hippolytidae | *Exhippolysmata oplophoroides* (Holthuis, 1948) |

**Table 2.** Species of hermit crabs captured in the São Vicente Estuarine Bay Complex.

| Order | Family | Species |
|---|---|---|
| Decapoda | Diogenidae | *Clibanarius vittatus* (Bosc, 1802) |
| | | *Isocheles sawayai* Forest & Saint Laurent, 1967 |
| | | *Loxopagurus loxochelis* (Moreira, 1901) |
| | | *Paguristes tortugae* Schmitt, 1933 |
| | Paguridae | *Pagurus criniticornis* (Dana, 1852) |

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**Table 3.** Species of Brachyura captured in the São Vicente Estuarine Bay Complex.

| Order | Family | Species |
|---|---|---|
| Decapoda | Portunidae | *Arenaeus cribrarius* (Lamarck, 1818) |
| | | *Callinectes bocourti* A. Milne-Edwards, 1879 |
| | | *Callinectes danae* Smith, 1869 |
| | | *Callinectes exasperatus* (Gerstaecker, 1856) |
| | | *Callinectes ornatus* Ordway, 1863 |
| | | *Callinectes sapidus* Rathbun, 1896 |
| | | *Charybdis hellerii* (A. Milne-Edwards, 1867) |
| | Hepatidae | *Hepatus pudibundus* (Herbst, 1785) |
| | Pisidae | *Apiomithrax violaceus* (A. Milne-Edwards, 1868) |
| | Panopeidae | *Panopeus austrobesus* Williams, 1983 |
| | Hexapodidae | *Hexapanopeus schmitti* Rathbun, 1930 |

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